A demonstrated application of a cost effective and novel platform for non-invasive acquisition of physiologic variables from spaceflight participant candidates

Problem Statement

- For NASA the area of human performance and health monitoring for human spaceflight is of continuing interest as specified by the Human Health, Life Support, and Habitation Systems roadmap.
- The Vital Space effort is focused on the development and implementation of innovative hardware and software solutions for the collection, storage, and retrieval of physiological data related to commercial spaceflight participants
- Users: Commercial spaceflight participants and equivalent counterparts

Technology Development Team

- **PI**: Ravi Komatireddy MD, Scripps Translational Science Institute. rkomat@scripps.edu

- **Funding**: NASA Flight Opportunities Program. **Partner Organizations:**

- 1. Sotera Wireless Inc.
- 2. Astronauts For Hire
- 3. MEDgle Inc.
- 4. The Scripps Research Institute

Proposed Flight Experiment

Experiment Readiness:

- Experiment is flight ready.

Test Vehicles:

- Zero G Corporation – Boeing 727-200

Test Environment:

- Zero gravity, lunar gravity and Martian gravity environments.

Test Apparatus Description:

- Sotera Wireless Inc. – ViSi Mobile. Non-invasive, FDA approved real time physiological monitoring platform.

Photo and Graphics of the Hardware

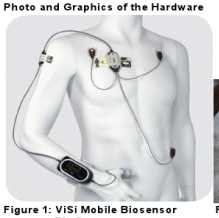

Figure 1: ViSi Mobile Biosensor Platform

Figure 2: ViSi Display and Control Unit

- Wireless Tablet PC
- Touch sensitive Operator Interface
- OLED Display

Graphic of software display

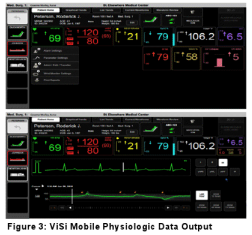

Figure 3: ViSi Mobile Physiologic Data Output

Technology Area Addressed: TA06 Human Health, Life Support and Habitation Systems

Technology Maturation

- Testing basic operation, human interface, and anticipated failure modes
- Identifying areas of risk for users and the flight environment
- Equivalency and Superiority testing against gold standard medical devices
- Clinical, physiologic research with subjects in the parabolic and suborbital environment using the ViSi system to obtain medical data
- Flight testing to reach TRL 6 is needed ASAP

Objective of Proposed Experiment

- 1. Assess successful basic operation of the ViSi with respect to continuous physiological data capture in microgravity conditions.
- 2. Assess ease of use and interface between the ViSi hardware, software, and subject under varying gravity loads.
- Successful use of hardware data capture in microgravity will allow progression of testing to physiological performance analysis of commercial space participants.